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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/803,949	03/19/2004	Xinming Wang	2004_0441A	7167

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EXAMINER
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BAREFORD, KATHERINE A

ART UNIT	PAPER NUMBER
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1762

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06/18/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/803,949	<b>Applicant(s)</b> WANG ET AL.	
	<b>Examiner</b> Katherine A. Bareford	<b>Art Unit</b> 1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 21 May 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,6-10,12-19 and 32-34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

*Claims 2-5, 11 and 20-31 have been canceled*

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on May 21, 2007 has been entered.

The amendment filed with the RCE submission of May 21, 2007 has been received and entered. With the amendment, claims 2-5, 11 and 20-31 are canceled, and claims 1, 6-10, 12-19 and 32-34 are pending for examination.

### ***Specification***

2. The amendment to the specification of May 21, 2007 is acceptable based on the Declaration of X. Wang under 37 CFR 1.132 filed May 21, 2007 indicating that the originally filed Japanese language translation used the terms now added.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1, 6-10, 12-19 and 32-34 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 1, line 15 has been amended May 21, 2007 to require that "the pretreatment liquid is an aqueous liquid free of any oxidizing agent". Applicant argues that this amendment is not new matter, because, as supported by the May 21, 2007 37 CFR 1.132 declaration of X. Wang, there is actually support in the original disclosure for such a limitation. The Examiner has reviewed Dr. Wang's declaration, however, she disagrees. Dr. Wang's evidence is in the form of opinion evidence, which as discussed in MPEP 716.01(c), "Although factual evidence is preferable to opinion testimony, such testimony is entitled to consideration and some weight so long as the opinion is not on the ultimate legal conclusion at issue." MPEP 716.01(c) further provides that "In assessing the probative value of an expert opinion, the examiner must consider the nature of the matter sought to be established, the strength of any opposing evidence, the interest of the expert in the outcome of the case, and the presence or absence of factual support for the expert's opinion. *Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 776 F.2d 281, 227 USPQ 657 (Fed. Cir. 1985), cert. denied, 475 U.S. 1017

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(1986).” Here, the matter sought to be established is whether new matter is present, as an inventor Dr. Wang has an interest in the case, as to the presence or absence of factual support, Dr. Wang points to passages in the specification that he interprets to mean that an oxidizing agent must not be present. However, the strength of the opposing evidence in this case is such that Dr. Wang’s position is not supported, and new matter is present. Specifically, it is factually established, by Fraenkel et al (US 4803097), that a known “oxidizing agent” to be used in electroless plating (column 2, lines 55-60) is sulfuric acid (column 9, line 53 through column 10, line 10, see especially column 9, line 67 and column 10, line 6). Throughout the specification, and in fact, in claim 1 as now filed, it is clearly provided that sulfuric acid is suggested to be provided in the pretreatment solution (see paragraphs [0093] and [0122] of the October 6, 2006 substitute specification). Therefore, the disclosure did, in fact, encompass the use of an oxidizing agent in the pretreatment solution. As a result, the amendment of May 21, 2007 is an improper negative limitation as described by MPEP 2173.05(i), because the negative limitation does not have basis in the original disclosure.

The other dependent claims do not cure the defects of the claims from which they depend.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1, 6-10, 12-19 and 32-34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1, line 15 now requires that "the pretreatment liquid is an aqueous liquid free of any oxidizing agent", however this is confusing and contradictory, because claim 1, line 18 provides that "sulfuric acid" can be provided in the pretreatment liquid, and "sulfuric acid" is a known oxidizing agent as described in Fraenkel et al (US 4803097), to be used in electroless plating (column 2, lines 55-60) is sulfuric acid (column 9, line 53 through column 10, line 10, see especially column 9, line 67 and column 10, line 6). This rejection also especially applies to claim 32, which specifically requires the presence of "sulfuric acid".

The other dependent claims do not cure the defects of the claims from which they depend.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 1, 6-9, 12-13, 17, 19 and 32-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ferrier et al (US 5843517) in view of Chen et al (US 6699380) and Japan 11-317161 (hereinafter '161).

Ferrier teaches a substrate processing method. Column 3, lines 15-35. A substrate is provided having both a metal region and an insulating film on a surface thereof. Column 2, lines 55-65 and column 4, lines 40-55. Ferrier provides a preplating treatment to the surface of the substrate, where pretreatment liquid (activator solution) is brought into contact with the surface of the substrate. Column 3, lines 15-25. This liquid etches the surface from the acid in the liquid (thereby removing a metal oxide film from the surface of the metal region and residue from a surface of the insulating film, which will inherently occur given the "etching" and the amount of acid in the solution). Column 3, line 65 through column 4, line 10 and column 4, lines 30-40. At the same time, the liquid also contains catalyst ions that impart a catalyst to the metal

region so as to activate the surface of the metal region. Column 3, lines 35-50 and column 4, lines 30-40. Then, pretreatment liquid remaining on the surface is removed in a rinsing treatment. Column 4, lines 20-25. Then an electroless plating process is performed on the surface of the substrate to selectively plate and alloy film on the surface of the metal region. Column 4, lines 20-30, column 3, lines 1-10, and column 5, lines 25-50. While Ferrier teaches adding an "oxidizing agent" to his pretreatment solution of aqueous acidic solution (column 3, lines 15-25), Ferrier also teaches "comparative" examples where the pretreatment liquid does not contain the "oxidizing agent" and rather can contain, for example aqueous acidic liquid containing palladium chloride (comparative example 1 or example 5 comparatives, for example) and notes the use of sulfates (column 2, lines 38-41) and further can contain acids in the form of hydrochloric acid (comparative example 1, 2) or sulfuric acid (comparative example 1, example 5 comparatives). Ferrier notes that electroless plating occurs from the comparative examples, and in some cases without overplate. See comparative examples 1 and 2 and example 5. The comparative examples teach useful and usable plating processes, because as discussed in MPEP 2123, "The use of patents as references is not limited to what the patentees describe as their own inventions or to the problems with which they are concerned. They are part of the literature of the art, relevant for all they contain." In re Heck, 699 F.2d 1331, 1332-33, 216 USPQ 1038, 1039 (Fed. Cir. 1983) (quoting In re Lemelson, 397 F.2d 1006, 1009, 158 USPQ 275, 277 (CCPA 1968)). Furthermore, MPEP 2123 goes on to state that "" A known or obvious composition does



not become patentable simply because it has been described as somewhat inferior to some other product for the same use." In re Gurley, 27 F.3d 551, 554, 31 USPQ2d 1130, 1132 (Fed. Cir. 1994)."

Claim 6: the pretreatment solution can be applied by spraying. Column 4, lines 30-40.

Claim 9: the substrate can be immersed in the pretreatment solution. Column 4, lines 30-40.

Claim 12: the rinsing includes rinsing with water. Column 5, lines 20-25.

Claim 17: a desired temperature of the solution is between 20-40 degrees C. Column 4, lines 30-40. A desired concentration of components is also given. Column 3, line 35 through column 4, line 10.

Claims 32: the comparative pretreatment liquid can include sulfuric acid. See comparative example 1 and example 5 comparatives. Palladium is provided in the pretreatment liquids from salts such as palladium chloride. See comparative example 1 and example 5 comparatives. Ferrier also provides the use of sulfates and chlorides to provide the salts. Column 3, lines 38-41. As to the use of sulfuric acid (although an oxidizing agent) note the 35 USC 112, second paragraph rejection above.

Claim 33: the preplating treatment simultaneously performs the metal oxide film removal (as shown by the etching), residue removal (as shown by the etching) and imparting the catalyst (activation). Column 4, lines 30-40.

Claim 34: the electroless plating is performed after removing the pretreatment liquid. Column 4, lines 20-30.

Ferrier does not teach that (1) the initial substrate is dry (claim 1), (2) that after electroless plating the substrate is post-cleaned and dried (claim 1), (3) spraying solution on a downwards facing substrate and rotating the substrate (claims 6,7), (4) the different flow paths (claim 8), (5) the pure water used (claim 12), (6) the cleaning using aqueous liquid mixed with one component or more of an electroless plating solution (claim 13), (7) maintaining conditions of the pretreatment conditions and electroless plating conditions (claims 17, 19), and (8) that the pretreatment liquid without oxidizing agent specifically removes metal oxide (claim 1). As to a dry substrate, Ferrier does teach that the process can begin with contacting with the pretreatment activator solution, as the steps 1 and 2 are optional (column 4, lines 15-30).

Chen teaches a substrate processing method that can be used to treat integrated circuits with metal regions. Column 1, lines 15-20. The process includes providing a dry substrate to a processing module. Column 8, lines 5-20. Then, preprocessing occurs. Column 8, lines 10-20. Then, plating, which can be electroless plating, occurs. Column 8, lines 15-25 and column 1, lines 25-30. Finally, post processing, including rinsing, cleaning, and drying occurs. Column 8, lines 20-30. Rinsing in the various steps can be done with pure water. Column 5, line 1 and 39. Liquid can be dispensed to the substrate from a nozzle and the substrate can be facing downwardly. Column 5, lines 1-20. The substrate can be rotated during the treatment steps. Column 5, lines 1-20.

'161 teaches that it is well known that an acid solution of palladium chloride can be used to both etch and catalyze a surface prior to electroless plating. See the abstract. This surface to be etched is of metal oxide. See the abstract.

Referring to claim 13, the examiner has taken official notice that it is well known in the art of electroless plating to rinse the substrate with a surface active agent, reducing agent, chelating agent, complexing agent, or other component of the electroless plating bath prior to plating the substrate. As applicant has not traversed this statement from the June 9, 2006 Office Action, it is understood to be agreed to.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Ferrier to (1) (2) provide that the initial substrate is dry and that after plating the substrate is post-cleaned and dried as suggested by Chen with an expectation of providing a desirable electroless plating process, because Ferrier teaches a pretreatment and electroless plating process for a substrate and Chen teaches that when providing a pretreatment and electroless plating process, it is well known to start with a dry substrate and to post-clean and dry the substrate after plating. It would further have been obvious to (3) modify Ferrier to provide spraying solution and rinsing liquid on a downwards facing substrate and rotating the substrate as suggested by Chen with an expectation of providing a desirable electroless plating process, because Ferrier provides that the pretreatment liquid in the plating process can be applied by spraying and Chen teaches that it is well known in electroless plating to provide the liquids to a downwards facing substrate and rotating the substrate during

treatments. (4) As to the different flow paths of claim 8, while the flow path system of the rinsing and the pretreatment fluid are not disclosed it would have been obvious to one of ordinary skill that the fluid leading into the nozzle from the pretreatment liquid source must flow from a different source than the rinsing fluid as the two fluids are different and must have different sources therefore the flow paths cannot be identical even if some of the same flow paths is used. (5) It would further have been obvious to modify Ferrier to provide pure water rinsing liquid as suggested by Chen with an expectation of providing a desirable electroless plating process, because Ferrier provides rinsing with water and Chen teaches that it is well known in electroless plating processes to provide pure rinsing water. (6) As to the cleaning using aqueous liquid mixed with one or more components of an electroless plating solution, it would have been obvious to modify Ferrier in view of Chen to provide such a cleaning liquid with an expectation of providing a desirable electroless plating process, because it is well known in the art of electroless plating to be desirable to rinse the substrate with a surface active agent, reducing agent, chelating agent, complexing agent, or other component of the electroless plating bath prior to plating the substrate. (7) As to maintaining the conditions of the pretreatment conditions and the electroless plating conditions, Ferrier teaches desirable pretreatment liquid conditions, and it would have been obvious to one of ordinary skill in the art to maintain the conditions within the desired ranges in order to achieve the desired benefits of those ranges. As to the electroless plating conditions, it would be obvious to one of ordinary skill to keep the

temperature, composition and component concentrations in predetermined ranges during the plating process so that the plating proceeds at a uniform rate. It would be obvious to one of ordinary skill to stop the plating process when the thickness of the plated layer reaches its desired thickness. (8) It further would have been obvious that the pretreatment solution of Ferrier in view of Chen without the added oxidizing agent can desirably etch a metal oxide film on the metal surface as suggested by '161 as part of the process of providing a desirable electroless plating film, because Ferrier in view of Chen teach that a pretreatment liquid of palladium chloride or other salts can be provided in a aqueous acid solution with hydrochloric or sulfuric acid without further oxidizing agent added as a pretreatment liquid before electroless plating and Ferrier also teaches the desire to activate and etch with pretreatment liquid, and '161 teaches that it is well known that palladium chloride in a acid solution can conventionally be used to etch and activate metal oxide surfaces, and thus the application of the palladium/acid solution without oxidizing agent of Ferrier can be desirably used for etching and activating.

10. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ferrier in view of Chen and '161 as applied to claims 1, 6-9, 12-13, 17, 19 and 32-34 above, and further in view of Stevens et al (US Patent No. 6824612).

Ferrier in view of Chen and '161 discloses all of the features of this claim except that the speed that the substrate is rotated at different times during the processing.

However, Stevens discloses that during the activation of a substrate for electroless plating it is desirable to rotate the substrate at relatively low speeds to facilitate even spreading of the activation solution, and after the application of the activating solution the substrate can be rotated at higher speeds in order to remove any excess activating solution (column 6 lines 30-45).

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Ferrier in view of Chen and '161 to use the rotational speeds suggested by Stevens with an expectation that the benefits discussed above will be achieved.

11. Claims 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ferrier in view of Chen and '161 as applied to claims 1, 6-9, 12-13, 17, 19 and 32-34 above, and further in view of Yoshio et al (US Patent No. 6555158).

Ferrier in view of Chen and '161 discloses all of the features of these claims except that the pretreatment and plating are performed in an atmosphere having less oxygen than the atmosphere (claims 14, 15) and that a film thickness/property is measured after post-cleaning and drying.

However, Yoshio teaches an electroless plating process that includes pretreatment steps. Column 2, lines 30-45. Yoshio teaches that it is desirable to perform the pretreatment, rinsing and plating while rotating and discharging air pressure, thus lowering the pressure below atmospheric, reducing the amount of oxygen to levels

below atmospheric. Figure 10 and column 7, lines 9-48. Yoshio also discloses performing a CMP (chemical mechanical polishing) procedure after the electroless plating, and that this can be done with ease. Column 8, lines 50-55. The only way to know the success of the CMP procedure is to measure the resulting film thickness after the CMP procedure.

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Ferrier in view of Chen and '161 to discharge air pressure during the process steps as suggested by Yoshio in order to provide desirable treatment because Ferrier in view of Chen and '161 provides for treatment while rotating and Yoshio teaches that it is desirable to discharge air pressure while rotating during treatment, thus lowering the pressure below atmospheric, reducing the amount of oxygen to levels below atmospheric. It would further have been obvious to modify Ferrier in view of Chen and '161 to measure film thickness after plating, post cleaning and drying as suggested by Yoshio in order to provide desirable treatment, because Ferrier in view of Chen and '161 provides plating, post cleaning and drying, and Yoshio suggests to further perform CMP procedures on the plated substrate, which would provide measuring the resulting film thickness after the procedure to confirm that the proper thickness and uniformity has been reached.

12. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ferrier in view of Chen and '161 as applied to claims 1, 6-9, 12-13, 17, 19 and 32-34 above, and further in view of Arcilesi et al (US Patent No. 4814205).

Ferrier in view of Chen and '161 teaches all of the features of the claim except measuring the concentration of an impurity and removing the impurity when it reaches a certain level.

Arcilesi teaches that when using an activator solution it deteriorates over time as the palladium ions precipitate out of the solution (form an impurity). Arcilesi teaches that when this happens the activator can be rejuvenated by addition of a ferric ion which redissolves the palladium (removes the impurity)(column 5 lines 15-30).

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Ferrier in view of Chen and '161 to monitor the concentration of the palladium ions and to add ferric ions to rejuvenate the solution when the amount of Pd ions got low so as to extend the useful life of the activator solution as suggested by Arcilesi.

#### *Response to Arguments*

13. Applicant's arguments with respect to claims 1, 6-10, 12-19 and 32-34 have been considered but are moot in view of the new ground(s) of rejection.

The Examiner notes the new 35 USC 112 first and second paragraph rejections provided due to the amendments to the claims.



As to the 35 USC 103 rejections, the Examiner notes the teachings provided by the Comparative Examples of Ferrier as discussed in the rejection above as to the use of a solution without added "oxidizing agent." The Examiner has provided the new reference to Japan 11-371161 as to the obviousness that the comparative pretreatment solution will both etch and activate the surface of the substrate. As to Ferrier teaching away from the use of a solution without added "oxidizing agent", the Examiner notes MPEP 2123:

"A known or obvious composition does not become patentable simply because it has been described as somewhat inferior to some other product for the same use." In re Gurley, 27 F.3d 551, 554, 31 USPQ2d 1130, 1132 (Fed. Cir. 1994) (The invention was directed to an epoxy impregnated fiber-reinforced printed circuit material. The applied prior art reference taught a printed circuit material similar to that of the claims but impregnated with polyester-imide resin instead of epoxy. The reference, however, disclosed that epoxy was known for this use, but that epoxy impregnated circuit boards have "relatively acceptable dimensional stability" and "some degree of flexibility," but are inferior to circuit boards impregnated with polyester-imide resins. The court upheld the rejection concluding that applicant's argument that the reference teaches away from using epoxy was insufficient to overcome the rejection since "Gurley asserted no discovery beyond what was known in the art." 27 F.3d at 554, 31 USPQ2d at 1132.).

In re Gurley as cited above would be to the point in this case, as Ferrier teaches that using the oxidizing agent provides better results, but that use of the pretreatment solution without the oxidizing agent still allows for electroless plating that can be desirable.

#### *Conclusion*


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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine A. Bareford whose telephone number is (571) 272-1413. The examiner can normally be reached on M-F(6:00-3:30) with the First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571) 272-1423. The fax phone numbers for the organization where this application or proceeding is assigned are (571) 273-8300 for regular communications and for After Final communications.

Other inquiries can be directed to the Tech Center 1700 telephone number at (571) 272-1700.

Furthermore, information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
KATHERINE BAREFORD  
PRIMARY EXAMINER